Micro-Dose Calibrator for Pre-clinical Radiotracer Assays

Summary (1024-character limit)

Pre-clinical radiotracer biomedical research involves the use of compounds labeled with radioisotopes, including radio-ligand bio-distribution studies, cell binding studies, immune cell labeling techniques, and -based therapies. Before this Micro-Dose Calibrator, measurement of pre-clinical level dosage for small animal studies was inaccurate and unreliable. This dose calibrator is a prototype ready for customer testing and scale-up. It is designed to accurately measure radioactive doses in the range of 50 nCi (1.8 kBq) to 100 µCi (3.7 MBq) with 99% precision. The NCI seeks co-development or licensing to commercialize it. Alternative uses will be considered.

NIH Reference Number

E-241-2016

Product Type

- Devices

Keywords

- Medical Radioisotope, Imaging Agent, Dose Calibrator, Adler

Collaboration Opportunity

This invention is available for licensing and co-development.

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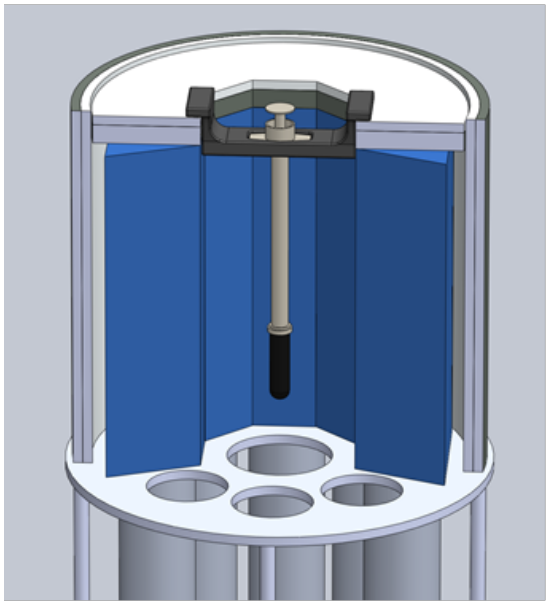
Description of Technology

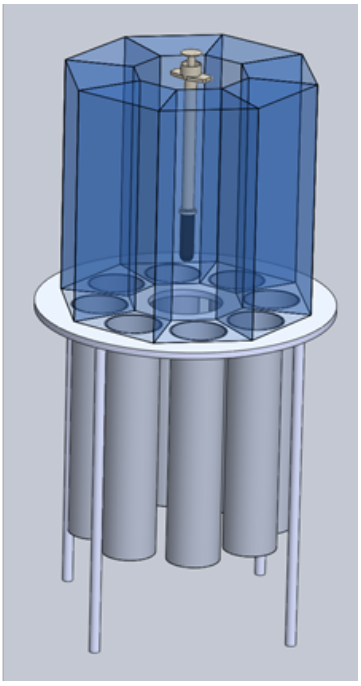
Molecular imaging is a disease-specific targeting modality that promises much more accurate diagnoses of serious diseases such as cancer and infections. Agents are being continually developed with a view to clinical translation, with several such therapies requiring measurement of very small doses. Currently, there is no way of accurately measuring small amounts of radioactivity used in many pre-clinical tracer studies, as on-the-market commercial dose calibrators measure at too high a dose range, typically at 10-1000 µCi and higher. Using such commercial calibrators to estimate micro-doses (0.01-10 µCi) results in unavoidable and up to ± 20% measurement errors. Alternatively, well-counters that can measure small doses are not suited for measurements of doses greater than 1 µCi, resulting in a coverage gap (1-10 µCi),

a critical range for bio-distribution studies, cell binding studies, immune cell labeling techniques, and □-based therapies.

To solve the problem of measuring a wider range of radioactivity doses, and without the need of a volumetric correction, the NCI Molecular Imaging Program invented a device (see images below) that can accurately measure radioactivity doses between 0.1-100 µCi, with 1% error. The device is a working prototype and requires collaboration to manufacture it. NCI seeks parties to commercialize this technology through collaborative co-development or licensing.

Video abstract: New and improved micro dose-calibrator designed to accurately measure radioactive doses in the range of 50 nCi to 100 µCi with 99% precision, useful in radio-ligand bio-distribution studies, cell binding studies, immune cell labeling techniques, and □-based therapies.





Potential Commercial Applications

- Bio-distribution pre-clinical studies Immune cell cancer therapy

Competitive Advantages

- Measure small doses between 50 nCi (1.8 kBq) and 100 µCi (3.7 MBq) with 1% accuracy
- Measure volumes of activity up to 20cc without volumetric correction to 1% accuracy

Inventor(s)

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Development Stage

- Prototype

Patent Status

- **U.S. Patent Filed:** U.S. Patent Application Number 62/554,980, Filed 06 Sep 2017

Therapeutic Area

- Cancer/Neoplasm
- Infectious Diseases
- Immune System and Inflammation